Claims

1. Method for identifying an order of devices (T1,T2,Td,...) in
   a network, wherein the network contains a large number of
   nodes (S1,S2,Sn,...) and each of the nodes (S) has a number
   of connections (P1S,P2S,PaS,...) by means of which the nodes
   (S1,S2,Sn,...) and the devices (T1,T2,Sd, ...) can be
   interconnected, comprising the following steps:
   a) Identifying the node (Sn) connected to one of the devices
   (Td),
   b) Ascertaining the number of connections of this node (Sn)
   and a predefined hierarchy of the connections,
   c) Determining for this node (Sn) the connection (PaSn) with
   which the device (Td) is connected to this node (Sn),
   d) Determining for this node (Sn) other connections which
   are connected to other nodes (S1,S2,...) or devices
   (T1,T2,...),
   e) Establishing a relationship between devices
   (T1,T2,Td,...) in the network on the basis of the connection
   hierarchy predefined for the node (Sn) and of the determined
   connections which are connected to the devices
   (T1,T2,Td,...) or other nodes (S1,S2,...).

2. Method according to claim 1, characterized in that the steps
   a)- e) are executed by each of the devices (Td).

3. Method according to one of claims 1 or 2, characterized in
   that with step e) another device is established as upstream
   neighbor and another device as downstream neighbor for each
   of the devices (Td).

4. Method according to one of claims 1-3, characterized in that
   each step of the method is repeated periodically.

5. Method according to one of claims 1-4, characterized in that the steps a)-e) of the method are repeated whenever a device is no longer connected to the network.

6. Method according to one of claims 1-4, characterized in that the steps a)-e) of the method are repeated whenever a new device is connected to the network.

7. Method according to one of claims 1-4, characterized in that the steps a)-e) of the method are repeated whenever a device is replaced by a new device.

8. Method according to one of claims 1-7, characterized in that the relationship established with step e) is stored in the devices or nodes.

9. Method according to claim 8, characterized in that a device which replaces another device in the network carries out the steps a-d) and interrogates its neighbor for the stored relationship.

10. Method according to one of the preceding claims, characterized in that the steps a) and c) are performed by means of a discovery protocol.

11. Method according to one of the preceding claims, characterized in that step d) is performed by means of the MAC addresses.

12. Method according to one of the preceding claims, characterized in that the relationship determined in step e) also contains the IP addresses of the other devices.

13. Apparatus for identifying an order of devices
(T1,T2,Td,...) in a network, with a large number of nodes
(S1,S2,Sn,...), each of the nodes (S) having a number

5 (MS) of connections (P1S,P2S,PaS,..., PMS) with a
predefined hierarchy and the nodes (S1,S2,Sn,...) and the
devices (T1,T2,Sd, ...) being interconnectable by means
of the connections, with:
- means of identifying the node (Sn) connected to one of

10 the devices (Td),
- means of determining other connections of the node Sn
which are connected to other nodes (S1,S2,...) or devices
(T1,T2,...),
- means of establishing a relationship between devices

15 (T1,T2,Td,...) in the network, on the basis of the
connection hierarchy predefined for the node (Sn) and of
the determined connections (PaSn,PavSn,PanSn) which are
connected to devices (T1,T2,Td,...) or other nodes
(S1,S2,...).

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14. Apparatus according to claim 13, characterized by means
of storing the established hierarchy.

15. Network having a large number of nodes and devices, and

25 at least one apparatus according to one of claims 13 or
14.

16. Network according to claim 15, characterized in that the
apparatus according to claim 13 or 14 is present in each of

30 the devices.

17. Network according to claim 14 or 15, wherein the network is an automation system containing controls, operator units, drives or actuators as devices.

5 18. Network according to claim 14 or 15, wherein the network is an ethernet containing personal computers or peripherals as devices.

19. Network according to claim 14 or 15, wherein the network
10   is a means of rail transport containing traction vehicles and cars as devices.

20. Computer program product for executing the steps according to one of the methods of claims 1-12.